

In the Claims

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2 1. (Currently Amended) An encoding system for determining position and
3 position changes of a moving member, comprising:

4 a sequence of encoder marks forming incremental patterns and at least one
5 index pattern, wherein two subsequent incremental patterns are indicative of an
6 incremental position-change of the moving member and the index pattern is
7 indicative of a reference position of the moving member;

8 a sensor arrangement viewing a section of the encoder-mark sequence, the
9 length of which is greater than one position-change increment;

10 an analyzer arranged to analyze an encoder-mark pattern in the viewed
11 section with regard to the incremental patterns and the index pattern and to
12 generate, in response to a pattern match found, ~~at least one of an incremental-~~
13 position-change signal and an index signal.

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15 2. (Original) The encoding system of claim 1, wherein the sensor
16 arrangement comprises a plurality of sensor elements arranged to simultaneously
17 detect a plurality of encoder marks in the section of the encoder-mark sequence.
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19 3. (Original) The encoding system of claim 1, wherein the index pattern has
20 a length, and the length of the viewed section corresponds to the length of the
21 index pattern.
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23 4. (Original) The encoding system of claim 1, wherein subsequent
24 incremental patterns overlap.
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2 5. (Original) The encoding system of claim 1, wherein the encoder marks
3 are identical.

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5 6. (Original) The encoding system of claim 1, wherein the system is a linear
6 or an angular encoding system.

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8 7. (Original) An encoding system for determining position and position
9 changes of a moving member, comprising:

10 a row of encoder marks arranged along the moving member in a generally
11 regular manner to provide incremental position-change information;

12 at least one index marking in the form of a predefined pattern of encoder
13 marks which represents a disturbance of the regular encoder-mark arrangement;

14 a sensor arrangement viewing a section of the row of encoder marks and
15 arranged to provide a viewed pattern of the encoder-mark section;

16 an analyzer arranged to analyze the viewed pattern to generate incremental-
17 position-change signals on the basis of the encoder marks and an index signal in
18 response to a detection of the predefined index mark pattern,

19 wherein the incremental-position-change signals are enabled to be
20 generated also in that section of the encoder-mark row in which the regular en-
21 coder-mark arrangement is disturbed by the index marking.

1 8. (Original) The encoding system of claim 7, wherein the sensor
2 arrangement comprises a plurality of sensor elements arranged to simultaneously
3 detect a plurality of encoder marks in the viewed encoder-mark section.

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5 9. (Original) The encoding system of claim 7, wherein the index marking
6 has a length, and the length of the viewed encoder-mark section corresponds to the
7 length of the index marking.

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9 10. (Original) The encoding system of claim 7, wherein the sensor
10 arrangement is arranged to detect, in the viewed section, a multiplicity of encoder
11 marks, so that the detected encoder marks carry redundant incremental position-
12 change information at least in regions of regular encoder-mark arrangement,
13 wherein the detection of the multiplicity of encoder marks enables the
14 incremental-position-change signals to be generated also in that section of the
15 encoder-mark row in which the regular encoder-mark arrangement is disturbed by
16 the index marking.

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18 11. (Original) The encoding system of claim 7, wherein the encoder marks
19 are equidistantly spaced in regions of regular encoder-mark arrangement.

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21 12. (Original) The encoding system of claim 7, wherein the encoder marks
22 are identical.
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1 13. (Currently Amended) The encoding system of ~~claim 1~~claim 7, wherein
2 the system is a linear or an angular encoding system.

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4 14. (Original) An encoding system for determining position and position
5 changes of a moving member, comprising:

6 a row of identical encoder marks forming incremental patterns and at least
7 one index pattern, wherein two subsequent incremental patterns are indicative of
8 an incremental position-change of the moving member and the index pattern is
9 indicative of a reference position of the moving member;

10 a sensor arrangement detecting a pattern of a section of the encoder-mark
11 row;

12 an analyzer arranged to analyze the detected encoder-mark pattern with
13 regard to the incremental patterns and the index pattern and to generate, in
14 response to an incremental-pattern match found, an incremental-position-change
15 signal and, in response to an index-pattern match found, an index signal.

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17 15. (Original) The encoding system of claim 14, wherein the sensor
18 arrangement comprises a plurality of sensor elements arranged to simultaneously
19 detect a plurality of encoder marks in the section of the encoder-mark row.

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21 16. (Original) The encoding system of claim 14, wherein the index pattern
22 has a length, and the length of the viewed section corresponds to the length of the
23 index pattern.

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2 17. (Original) The encoding system of claim 14, wherein the sensor
3 arrangement comprises a sensor element arranged to successively detect the
4 encoder marks or groups of the encoder marks in the section of the encoder-mark
5 row upon the movement of the moving member, wherein the encoding system is
6 arranged to combine the successively detected encoder marks to form the detected
7 encoder-mark pattern.

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9 18. (Original) The encoding system of claim 14, wherein subsequent
10 incremental patterns overlap.

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12 19. (Original) The encoding system of claim 14, wherein the system is a
13 linear or an angular encoding system.

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15 20. (Currently Amended) A printing device having an encoding system for
16 determining position and position changes of a recording medium conveyor to
17 determine the position of a recording medium placed on the conveyor, comprising:

18 a sequence of encoder marks forming incremental patterns and at least one
19 index pattern, wherein two subsequent incremental patterns are indicative of an
20 incremental position-change of the conveyor and the index pattern is indicative of
21 a reference position of the conveyor;

22 a sensor arrangement viewing a section of the encoder-mark sequence, the
23 length of which is greater than one position-change increment;

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1 an analyzer arranged to analyze an encoder-mark pattern in the viewed
2 section with regard to the incremental patterns and the index pattern and to
3 generate, in response to a pattern match found, ~~at least one of an incremental-~~
4 position-change signal and an index signal.

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6 21. (Original) The printing device of claim 20, wherein the recording
7 medium conveyor is a belt conveyor.

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9 22. (Original) The printing device of claim 20, wherein the encoder-mark
10 sequence is an encoder-mark row arranged along the recording medium conveyor.

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12 23. (Original) The printing device of claim 20, wherein the printing device
13 has a plurality of print stations arranged along the recording medium conveyor,
14 and each print station is individually equipped with said sensor arrangement and
15 analyzer.

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17 24. (Original) The printing device of claim 20, wherein the printing device
18 is a page-wide ink-jet printer.

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20 25. (Original) A printing device having an encoding system for determining
21 position and position changes of a recording medium conveyor to determine the
22 position of a recording medium placed on the conveyor, comprising:

23 a row of encoder marks arranged along the conveyor in a generally regular
24 manner to provide incremental position-change information;
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1 at least one index marking in the form of a predefined pattern of encoder
2 marks which represents a disturbance of the regular encoder-mark arrangement;

3 a sensor arrangement viewing a section of the row of encoder marks and
4 arranged to provide a viewed pattern of the encoder-mark section;

5 an analyzer arranged to analyze the viewed pattern to generate incremental-
6 position-change signals on the basis of the encoder marks and an index signal in
7 response to a detection of the predefined index mark pattern,

8 wherein the incremental-position-change signals are enabled to be
9 generated also in that section of the encoder-mark row in which the regular en-
10 coder-mark arrangement is disturbed by the index marking.

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12 26. (Original) The printing device of claim 25, wherein the recording
13 medium conveyor is a belt conveyor.

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15 27. (Original) The printing device of claim 25, wherein the printing device
16 has a plurality of print stations arranged along the recording medium conveyor,
17 and each print station is individually equipped with said sensor arrangement and
18 analyzer.

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20 28. (Original) The printing device of claim 25, wherein the printing device
21 is a page-wide ink-jet printer.

1 29. (Original) A printing device having an encoding system for determining
2 position and position changes of a recording medium conveyor to determine the
3 position of a recording medium placed on the conveyor, comprising:

4 a row of identical encoder marks forming incremental patterns and at least
5 one index pattern, wherein two subsequent incremental patterns are indicative of
6 an incremental position-change of the conveyor and the index pattern is indicative
7 of a reference position of the conveyor;

8 a sensor arrangement detecting a pattern of a section of the encoder-mark
9 row;

10 an analyzer arranged to analyze the detected encoder-mark pattern with
11 regard to the incremental patterns and the index pattern and to generate, in
12 response to an incremental-pattern match found, an incremental-position-change
13 signal and, in response to an index-pattern match found, an index signal.

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15 30. (Original) The printing device of claim 29, wherein the recording
16 medium conveyor is a belt conveyor.

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18 31. (Original) The printing device of claim 30, wherein the encoder-mark
19 row is arranged along the recording medium conveyor.

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21 32. (Original) The printing device of claim 30, wherein the printing device
22 has a plurality of print stations arranged along the recording medium conveyor,
23 and each print station is individually equipped with said sensor arrangement and
24 analyzer.
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2 33. (Original) The printing device of claim 30, wherein the printing device
3 is a page-wide ink-jet printer.
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5 34. (Currently Amended) A method of determining position and position
6 changes of a moving member using a sequence of encoder marks which forms
7 incremental pat-terns and at least one index pattern, wherein two subsequent
8 incremental patterns are indicative of an incremental position-change of the
9 moving member and the index pattern is indicative of a reference position of the
10 moving member, comprising the steps:

11 viewing a section of the encoder-mark sequence, the length of which is
12 greater than one position-change increment;

13 analyzing a encoder-mark pattern in the viewed section with regard to the
14 incremental patterns and the index pattern; and

15 generating, in response to a pattern match found, ~~at least one of an~~
16 incremental-position-change signal and an index signal.
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1 35. (Original) A method of determining position and position changes of a
2 moving member using a row of encoder marks arranged along the moving member
3 in a generally regular manner to provide incremental position-change information;
4 at least one index marking in the form of a predefined pattern of encoder marks
5 which represents a disturbance of the regular encoder-mark arrangement,
6 comprising the steps:

7 viewing a section of the row of encoder marks;

8 providing a viewed pattern of the encoder-mark section;

9 analyzing the viewed pattern to generate incremental-position-change
10 signals providing the incremental position-change information on the basis of the
11 encoder marks and an index signal in response to a detection of the pre-defined
12 index mark pattern,

13 wherein the incremental-position-change signals are enabled to be
14 generated also in that section of the encoder-mark row in which the regular
15 encoder-mark arrangement is disturbed by the index marking.